

What is claimed is:

1. A method of integrating an exogenous nucleic acid into the genome of at least one cell of a multicellular organism, said method comprising:  
administering to said multicellular organism:
  - (a) a Sleeping Beauty transposon comprising said exogenous nucleic acid;
  - and
  - (b) a source of Sleeping Beauty transposase activity;whereby said nucleic acid is integrated into said genome.
2. The method according to Claim 1, wherein said source of Sleeping Beauty transposase activity comprises a nucleic acid encoding a protein having Sleeping Beauty transposase activity.
3. The method according to Claim 1, wherein said transposon and source of transposase activity are present on separate vectors.
4. The method according to Claim 1, wherein said transposon and source of transposase activity are present on the same vector.
5. The method according to Claim 1, wherein said multicellular organism is a vertebrate.
6. A method of inserting an exogenous nucleic acid into the genome of at least one cell of a mammal, said method comprising:  
administering to said mammal:
  - (a) a Sleeping Beauty transposon comprising said exogenous nucleic acid;
  - and
  - (b) a source of a Sleeping Beauty transposase activity;whereby said exogenous nucleic acid is inserted into said genome.
7. The method according to Claim 6, wherein said source of Sleeping Beauty transposase activity comprises a nucleic acid encoding a protein having Sleeping Beauty transposase activity.

8. The method according to Claim 6, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on separate vectors.
9. The method according to Claim 6, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on the same vector.
10. The method according to Claim 6, wherein said exogenous nucleic acid comprises a gene.
11. The method according to Claim 10, wherein said gene encodes a therapeutic protein.
12. A method for expressing an exogenous gene in at least one cell of a multicellular organism, said method comprising:
  - administering to said organism:
    - (a) a Sleeping Beauty transposon comprising said exogenous gene; and
    - (b) a source of Sleeping Beauty transposase activity,
  - whereby said gene is integrated into the genome of at least one cell of said multicellular organism and expressed therein;
  - whereby said exogenous gene is expressed in said at least one cell of said multicellular organism.
13. The method according to Claim 12, wherein said source of Sleeping Beauty transposase activity comprises a nucleic acid encoding said transposase.
14. The method according to Claim 12, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on separate vectors.
15. The method according to Claim 12, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on the same vector.
16. The method according to Claim 12, wherein said multicellular organism is a vertebrate animal.

17. The method according to Claim 16, wherein said vertebrate animal is a mammal.
18. The method according to Claim 12, wherein said exogenous gene encodes a therapeutic product.
19. A method for at least enhancing the amount of a protein present in a multicellular organism, said method comprising:  
administering to said organism:  
(a) a Sleeping Beauty transposon comprising an exogenous gene encoding said protein; and  
(b) a source of Sleeping Beauty transposase activity;  
whereby said gene integrate into the genome of at least one cell of said multicellular organism and is expressed therein;  
whereby the amount of said protein in said multicellular organism is at least enhanced.
20. The method according to Claim 19, wherein said source of Sleeping Beauty transposase activity comprises a nucleic acid encoding said transposase.
21. The method according to Claim 19, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase are present on separate vectors.
22. The method according to Claim 19, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase are present on the same vector.
23. The method according to Claim 19, wherein said multicellular organism is a vertebrate animal.
24. The method according to Claim 23, wherein said vertebrate animal is a mammal.
25. The method according to Claim 19, wherein said multicellular organism comprises substantially no amount of said protein prior to said administering step.

26. The method according to Claim 19, wherein said multicellular organism comprises at least some amount of said protein prior to said administering step.

27. A method of in vivo transfer of a gene into the genome of at least one cell of a multicellular organism, said method comprising:

administering to said multicellular organism:

- (a) a Sleeping Beauty transposon comprising said gene; and
- (b) a source of a Sleeping Beauty transposase activity;

whereby said gene is transferred into said genome.

28. The method according to Claim 27, wherein said source of Sleeping Beauty transposase activity comprises a nucleic acid encoding a protein having Sleeping Beauty transposase activity.

29. The method according to Claim 27, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on separate vectors.

30. The method according to Claim 27, wherein said Sleeping Beauty transposon and said source of Sleeping Beauty transposase activity are present on the same vector.